

© *Sir Gilbert Blane, bart.*

A

SHORT ACCOUNT
OF THE
MOST EFFECTUAL MEANS
OF PRESERVING
THE HEALTH OF SEAMEN.

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1780?

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Thomas D. Harris,
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To
THE FLAG-OFFICERS
AND
CAPTAINS
OF HIS MAJESTY'S SHIPS OF WAR
ON THE *WEST-INDIA* STATION,

THE FOLLOWING PAGES
ARE RESPECTFULLY INSCRIBED

By

THEIR MOST FAITHFUL AND

MOST OBEDIENT SERVANT,

GILBERT BLANE.

SANDWICH, Off ANTIGUA,

21st August, 1780.

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As this work was written and printed during the hurry of service, the Reader is desired to excuse any errors in point of elegance and correctness, as well as general perfection.

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Advertisement.

MY design is to exhibit, in as concise a form as possible, a view of all that has been discovered, so far as I know, concerning the means of preserving the health of Seamen. Besides what I have learned from my own observation, and from the conversation of naval Officers and men of the medical profession, a great part of what is here advanced has been extracted from Authors, and particularly from the works of Dr. Lind, and Capt. Cooke.† As the observations on this important subject lie dispersed in voluminous writings, to which officers have seldom time or opportunity to resort, I thought it would be a useful and acceptable undertaking to collect them into a small compass, together with such new remarks as have occurred to others as well as myself, particularly respecting this station.

More may be done towards the preservation of the health and lives of seamen than is commonly imagined, and it is plainly a matter not only of humanity and duty, but of interest and policy. The forming of a seaman depends upon a long habit of life, and a practical education, as it were, from an early period of life; so that if our stock of mariners were exhausted, or diminished, neither treasure nor any other means could repair the loss. In this view, as well as from the peculiar dependence of Britain upon her navy, this order of men is truly inestimable. Moreover, considering man merely as a commodity in an æconomical and political view, independently of moral considerations, it could be made clear that their health and lives might be preserved at infinitely less expence and trouble than what are necessary to repair the ravage of disease.

That the health of ships companies depends upon means within our power, is strongly evinced by this; that ships in the same situation of service enjoy very different degrees of health. It cannot escape observation, that in this, and every other fleet, there are ships with the same complement of men, which have been the same length of time at sea, and have been victualled and watered in the same manner, some of which are extremely sickly while others are free from disease. It is to be inferred from this, that the health of ships companies depends in a great measure upon circumstances within the power of officers, and upon them

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† It is to Dr. Lind we are indebted for the most accurate, ingenious, and original observations on this subject, and Sir John Pringle has given an excellent compendium of Capt. Cooke's improvements on his elegant discourse before the Royal Society.

much more than the medical branch, the health of the men depends, in as much as prevention is better than cure, and the art of physic is at best but fallible. || It is prevention only that is the subject of this little treatise, which is therefore addressed to commanders, in whose hands alone the means of it are, since it depends on matters of police which they only can enforce, and I am well persuaded that a certain degree of attention on their part would almost entirely extirpate disease from the navy.

Several obvious and well-known particulars will be found on the perusal of the following pages, which it may be thought superfluous to mention. But it was my intention to omit nothing of consequence which I have heard of, or observed as a matter of ascertained utility, and I believe the most experienced will find either something new, or what they had not before sufficiently attended to. Although the design of this work is to be extensively useful, yet my trouble would be compensated, should it prove the means of health and comfort even to a single ship's company. Nay, I should not repent my labour, could I enjoy the conscious certainty of its having saved the life of one brave and good man.

|| It is not meant by this to insinuate that every commander is absolutely accountable for the health of his ship's company, and censurable when they are sickly, for this may depend on his predecessor, or a stubborn infection may have prevailed from the original sitting and manning which he may not have superintended.

MEANS OF PRESERVING THE HEALTH OF SEAMEN.

THOSE who live at sea are in a certain degree exempt from some of the diseases to which a life on land is subject, but there are more fatal diseases incident to the former than the latter. The superior purity of the air at sea is more than counter-balanced by the artificial means of propagating disease on board of a ship. But as the air is so pure at sea, and as the causes of disease peculiar to a sea-faring life are chargeable rather to the mismanagement of men, than to the unavoidable course of nature, we are encouraged to exert our attention in endeavouring to eradicate them.

The only very fatal diseases incident to seamen are fevers, fluxes, and the scurvy.

I. OF FEVERS.

WHEN a fever is very prevalent in a ship, it is almost always infectious, and this infection has either been visibly introduced into her from without, by the persons or clothes of men, or it has arisen from causes existing within the ship herself. The means of prevention should have regard to both these.

1. *Means of preventing the Introduction of Infection.*

The introduction of infection is prevented by great caution in admitting men who come from jails, guardships, tenders, captured vessels, and in general those who are remarkably ragged and dirty, or who have come from ships or other places where the fever is known to have prevailed.

The mode of manning the navy by pressing is, I suppose, unavoidable,
but

but it is one of the greatest means of sowing the seeds of disease. As this cannot be remedied, and as the exigency of the service in time of war does not permit that persons of any description be excluded, it becomes highly necessary to prevent the effects of the contagion that may adhere to them. This is done by stripping and washing their bodies, by cutting off their hair, and destroying all their clothes, before they are allowed to mix with the ship's company in which they are going to enter. Those who have strictly put those methods in practice know how effectual and infallible they are, and exact attention is necessary, as a single infected man, or any part of his cloathing, will spread sickness through a whole ship's company. Men in health who are remarkably dirty, or that have been in the company of those who have been affected with an infectious fever, will communicate disease as much as the sick themselves, and the jail distemper has been known to proceed from prisoners who were not themselves affected by it. When we reflect what havoc an infectious fever sometimes makes in a ship, it will appear how infinitely important it is to attend exactly to this circumstance; for if the cause of the sickness of particular ships be traced to its source, it will generally be found to have arisen from taking in infected men at Spithead, or wherever else the ship's company may have been completed.

2. Means of preventing the Production of Infection.

Fevers of an infectious nature are not always produced by the introduction of any evident causes of contagion, but the infection seems frequently to arise spontaneously, as it were, being either actually generated, or being excited or rendered noxious, when it would otherwise have been lain dormant and inactive. The means of preventing this sort of infection in a ship are chiefly fresh air and cleanliness, shelter from cold and wet, and keeping the ship from being too much crowded. Nature has wisely contrived our instincts for avoiding filth, by rendering those places loathsome to the senses which have been long crowded with numbers of people, and by making it offensive both to ourselves and others to keep the same cloathes long in contact with the body. It is this, joined to a narrow and confined situation, that gives rise to the jail distemper, and fevers of a
*There are indeed certain atmospheres both afloat & a like
 shore which agree only with those who are habituated
 to them & this is the reason that two ships companies
 may be healthy separately & unhealthy when mixed
 such a mixture should therefore be avoided as much
 as possible.*

like kind that originate in hospitals and ships where similar circumstances concur.

The means that have been found most effectual for keeping men clean, and preventing them from neglecting their persons, from poverty, slovenliness, or parsimony, have been,

1. To see that all that enter be provided with a proper change of linen, and that a weekly review be made to see that the men are clean. Every man should be made answerable for a certain necessary quantity of slops, and it has been the practice of some of our most able and intelligent Commanders to form the ship's company into divisions and squads, the weekly inspection of whose persons and clothing is assigned to as many respective officers.† This would both prevent the unhealthiness arising from nastiness, and diminish the means of drunkenness procured by disposing of slops. A review of this kind would also prevent seamen from allowing their wet and dirty cloathes to lie in a chest or corner till they are corrupted, and become a source of nastiness and disease. It will appear clearly to any one who reflects well on the subject, that a regulation of this kind is as necessary as any other piece of duty, and it perhaps deserves to be made an article of the public instructions, instead of being left to the discretion of officers. There are ships that allow the men a day in the week for washing their cloathes, and I have observed the best effects from it. The trouble that is taken in attending to neatness, order, and sobriety, never fails to be rewarded with a healthy ship's company, to the great satisfaction and private comfort of the Commander, and the unspeakable advantage of the public service. It is of consequence that the Purser should lay in a sufficient quantity of slops, suited to the climate for which the ship is destined, in order that there may be a supply after she has been for some time from home upon a distant station. ||

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† It was an article in the instructions of the late Commander in Chief in America, that the ship's company should be divided into as many divisions as there were Lieutenants, and these divided into squads, with a midshipman appointed to each, who should be respectively responsible for the good order and discipline of the men.

|| It would tend greatly to the health of seamen to have a navy uniform established, that they might always have in their possession, and be accountable for a certain quantity of decent apparel, subject to the regular inspection of their officers.

It would be a good rule to supply soap by stoppages as they do slops.

2. To air and exercise the men above decks, when their duty does not lead them to do so, and to air their hammocks by exposing them upon deck, especially after the ports have been long shut in consequence of bad weather. The hammocks cannot be thoroughly aired unless they are unlashd. This cannot with any convenience be done daily in a man of war, but it might be done from time to time by the different divisions in rotation, and the same may be said of scrubbing and washing. When they come to be lain upon after these operations, the same agreeable sensation is produced that one experiences from a change of linen, which highly conduces to health and pleasure, like all other natural and moderate gratifications.

3. To keep the ports open as much as possible, and to have scuttles in them for the admission of fresh air. This is extremely useful every where, but particularly in the West-Indies. It should never be neglected to cut scuttles in the sides of frigates destined for this station, for otherwise the heat between decks is almost insupportable.

4. To fumigate frequently with fires of wood sprinkled with pitch or rosin, carried about between decks in a pot or moveable grate, or in a tub with shot in it when the ports can be opened; or, if the weather will not admit of this, to burn gun-powder wetted with vinegar. The sick berth should be occasionally washed all over with vinegar. The good effects of fire and smoke is strongly evinced by this, that when it was the custom for frigates to have their kitchens between decks they were remarkably more healthy than they are now that they have them under the fore-castle, where the heat and smoke are dissipated without being diffused through the ship, and causing a draught of air upwards as formerly, not to speak of the benefit and comfort arising from having a large fire round which men may assemb'le and warm and dry themselves in a sheltered place. I leave it to those who preside in the construction of the navy how far an alteration in this respect would be adviseable in fitting this class of ships.

5. To wash and scrape all the decks frequently.* Washing may produce

* Lord Howe gave it as part of his instructions to wash the upper decks every day, the lower decks twice a week, and the orlop once a week at least. He also requested that every washing, smoking, mustering of cloathes, or other means for the health of the ship, should be marked in the log-book, and the reason to be assigned there if they were omitted at the regular times. That it is method of this kind alone that can make service truly effective and easy, is too well known to the experienced officer to need inculcating.

It is aquainted with those whom I have known most successful in preserving the health of their men to keep the hold dry by a daily fire in the well, by never allowing the ship to make more than 5 Inches water & by bailing out what the pumps cannot exhaust

duce unwholesome moisture, and care should be taken to do it in dry weather, if possible, and as early in the day as convenient, that there may be time for it to dry. It is after washing that fires are most applicable and useful. †

6. To work ventilators, and to put down wind-sails, as often, and for as long a time as possible. This is more particularly necessary in large ships, where the mass of foul air is so great, and so remote from the access of the external air, that it cannot be thoroughly swept off but by such contrivances. Under this head it may be recommended to keep the decks as clear as possible from chests and other lumber which are in the way of sweeping and washing, and prevent the free course of the air.

7. To berth the watches alternately, which at the same time preserves the trim of the ship. By this arrangement men lie much cooler, and it is more agreeable in every respect, as well as more healthy.

Though foul air and uncleanness are the chief causes that produce an infectious fever, yet excessive fatigue, too much exposure to heat, cold, and wet, scanty or unwholesome food, bad water and intoxication contribute severally to awaken the seeds of this disease.

3. *Means of Eradicating Infection.*

It too frequently happens that from a neglect of the means that have been mentioned, an infectious fever comes to prevail, and when once it has gained ground adheres obstinately to a ship, in spite of cleanliness, good air and diet, and all the other means that have been prescribed for preventing

† Dryness is perhaps of as great consequence as any one thing that can be named, for not only the complaints commonly called colds, are more owing to wet than cold, but moisture is the means of producing or at least exciting dangerous fevers and contributes greatly to the production of scurvy. It is observed that new ships are generally unhealthy. Whether this is owing to moisture merely as such, or to something specifically noxious in the exhalation of wood I will not take upon me to determine, but the fact is well ascertained. Wood is moist either by being used in too recent a state or by being injudiciously stripped of its bark and outer surface when piled and exposed to the weather in yards.

I owe this observation as well as many others in this treatise to an officer whose extensive merits and virtues in the great line of his country's service places him above praise in a subject like this.

preventing infection. In this situation some measures have been thought of for *eradicating* this subtle poison. The means that have been found most effectual are,

1. To keep the sick separate from the sound, and to cut off all intercourse as much as possible, in order to prevent its progress. For this end it is necessary to appropriate a sick berth to contagious complaints, and not only to prevent the men in health from gossiping about it, but to find out and separate such complaints as soon as possible, both to prevent them from being caught by others, and because recent complaints are more manageable and curable. Those whose profession it is to superintend the health of the ship would find it for their ease and interest as well as duty, to walk over the different decks once a day or every other day in order to discover early those who are taken ill.

2. It has been mentioned before that the cloathes of men are as dangerous a vehicle of infection as their persons, and it should be made a strict and invariable rule that in case of death from Fever or Flux, every article of bedding and clothing about the body be thrown over-board along with it. Upon the same principle, in case of recovery from either of these diseases, as it seldom can be afforded to destroy the clothes and bedding, they should if possible be smoked and then scrubbed or washed before the men join their messes and return to duty, as their hammocks will frequently have occasion to come in contact with those of the other men. If the trouble of all this be objected to, let us reflect for a moment how much more troublesome sickness itself is, how noisome and disagreeable, and what a clog it is to publick service; not to mention the regard due to the sufferings of the objects themselves.

3. It sometimes adheres to the timbers for months and years together and can be eradicated only by a thorough fumigation. This cannot well be done but when the ship is in such a situation that every person can be turned out in order that pots of charcoal and sulphur may burn between decks while the smoke is confined by shutting the hatches. An action with the enemy has been known to purge a ship from infection.

4. To persevere more regularly and frequently in the use of fires, and in the practice of scraping and washing the decks and beams, particularly in

in the sick births where hot vinegar should be sprinkled twice a day on the beams planks and sides. The fumes of pitch tar and other resinous substances has a more powerful effect than any other smoke, and besides what is thrown upon the fires, it would be useful to throw pitch upon a red hot iron, or to immerse a loggerhead in a vessel where there is pitch or tar. It has an extremely good effect also to white-wash all the decks and beams with quicklime. But a complete smoking is the only radical and effectual remedy and the sooner it is applied the better, for the longer infection continues the more it accumulates.

* It sometimes happens that the numbers of sick in a ship are so great that it is not possible to take proper and effectual measures for stopping the progress of disease. But when she can be cleared of her sick by sending them to an hospital, no pains should be spared to extirpate the remaining seeds of infection. Let their clothing and bedding be sent along with them: their hammocks, utensils, and whatever they leave behind, should be smoked, and either scrubbed or washed before they are used by other men, or mixed with the ship's stores: the decks, sides, and beams of their berths should be well washed, scraped, smoked and dried by fire, and finally white-washed all over with quick-lime.

It may be proper to mention in this place that the orlop, and all below it, by being below water is more apt to become a receptacle of nastiness, and by being less under the eye of the Captain and other officers, is more apt to be neglected. I think I have seen sickness propagated and continued from this circumstance when the quarter-deck and gun-decks have been kept sufficiently clean. The well and the hold should also be attended to, and a grate with fire in it should be let down from time to time. When the hold has been long shut, it becomes full of a deadly air, and the common method of trying it by a lighted candle is so well known as hardly to need mentioning.†

4. Means

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† This bad air, however, is not productive of epidemic diseases, the only air that is really to be feared in this way being that which is fouled by the stagnating effluvia of the living human body. The air of the hold which renders bilge water so offensive is rather to be considered as disagreeable than pernicious unless when so strong as to produce suffocation.

Dryness & circulation of air can not be enough attended to. I have known great advantage from daily letting down a grate or pot with fire into the well when moisture & disease prevailed. To prevent filth & moisture the shingle ballast is most preferable to the sandy sort commonly employed.

4. *Means of Guarding against Infection.*

Lastly. If an infection actually prevails, and one is unavoidably exposed to it, the best means to prevent its taking effect are, to live in a hearty and generous manner, particularly in the article of drink, but always within the limits of intoxication. It is of the utmost consequence to avoid excess, irregularity and exposure, such as intoxication, fatigue, fasting, watching and getting wet. To these may be added certain affections of the mind, such as care, grief and fear, which in like manner weaken the powers of life, and render the constitution more accessible to the assaults of disease. I have already mentioned separation as a principal means of stopping the progress of contagion, but those who are under the necessity of approaching the sick should avoid close contact and their breath, they should not go within their influence with an empty stomach, and should smell to vinegar and camphor when near them.

It is highly worth while here to observe that the influence of infectious distempers does not extend so far as is commonly imagined. It is now known for certain that the infection of the Plague does not extend above a few yards, and the same seems to hold with regard to malignant fevers. This discovery is very valuable by ascertaining the degree of risk, for when men imagined themselves in the same danger when at a considerable distance from the seat of a particular disease, as if they had been in contact with the sick, they exposed themselves rashly and unnecessarily to the infection.

All the preceding observations concerning infection are particularly applicable to the fevers prevailing at sea, which however are not so frequent in this climate as in England.† There are other sources of fever only to be

† This is a remark which, so far as I know, has not been made by any author, and till observation convinced me of it I fancied the reverse to be true. It is certain that there is something in the tropical climates adverse to the production or continuation of infectious fevers. I have seen so many instances of crowding and nastiness in ships and hospitals without contagion being produced, and which in Europe would have excited it, or rendered it more malignant, that the fact is ascertained beyond a doubt. Farther, those ships which bring this infectious fever from Europe in general get rid of it soon after coming to this climate, and nothing but the highest degree of neglect can revive it. This brought into my mind what is related of the Plague at Smyrna and other

be met with on shore, such as the neighbourhood of woods and marshes, the vapours of which produce intermitting and bilious fevers, and they deserve attention here, as sailors are occasionally exposed to them. The preservatives against such fevers; besides temperance and the avoiding of cold, wet and fatigue, are cold bathing, good living, particularly in the article of drink, and the use of some bitter medicine, such as an infusion of Peruvian bark or chamomile flowers.

II. OF F L U X E S.

THERE are few remarks to be made upon these, besides what have been delivered on fevers, the same rules being applicable in a great measure to both. The flux seems indeed frequently to be a kind of substitute for fevers, as it prevails most in those ships that have brought from Europe an infectious fever. This ceases upon coming into the country, and is succeeded by the dysentery, which seems to be the last effort of the contagion, modified into this form by the influence of the climate. It seems at other times to be a spontaneous disease as well as fever; for both will sometimes arise in this climate at sea without any suspicion of infection or a specific quality of the air, and merely from circumstances of heat, cold, wet, fatigue, intemperance, &c.

With regard to prevention, besides the rules of cleanliness, dryness, smoking and airing, which are necessary to prevent and root out fevers, attention should be paid that men upon first coming to this climate be exposed as little as possible to sudden changes of heat and cold, or to hard labour, especially in the night air, or in rainy weather. As it is the disease most incident to those new-comers who use a sea life, it is probable that the diet, and other circumstances peculiar to a sea life, tend to produce

other places; that it disappears at the hottest part of the season, and it is a disease we never hear of in the Torrid Zone. It is very difficult to ascertain the cause of this, as every thing relating to infection is very obscure. We can conceive it to be owing to the greater degree of airiness which the heat of the climate makes necessary, or the employment of less woollen clothes; there may be something in the state of the body, particularly of its surface, which disposes it less to produce or imbibe the poisonous effluvia, or more probably the virulent matter is of such a degree of volatility as to be readily dissipated in a certain degree of heat.

duce it, and therefore a fresh and vegetable diet should be used as much as possible upon first coming into this climate, and indeed ever afterwards. As the bowels are the seat of this disease, every error in diet should be carefully avoided, and moderation in point of the quantity of what we eat and drink is as necessary as the choice in point of quality. The nature of the disease is such that it is necessary to pay greater attention to cleanliness and the separation of the sick than in fevers, as it is more catching and more offensive. It has been found of material benefit in preventing dysenteries to put quick-lime into the water, the bad quality of which concurs with other causes in producing them in this climate. This is a good practice every where, and at all times, for nothing is more powerful in sweetening and preserving water than this substance.

I have thus gone through the two acute diseases to which seamen are most liable, namely, Fever and Flux. If I were to mention any others, they would be Colds and feverish and rheumatic complaints in consequence of cold and wet. All sorts of fevers may be more or less owing to cold and moisture, and infection itself will frequently not take effect without their influence. They are fruitful sources of complaint even in hot climates, and it is a great point to preserve clothing uniform and dry as the body when under the influence of external heat is extremely sensible to every change and vicissitude in the quality of the air. To prevent these effects I have nothing to add to what has been already mentioned, except to recommend a prudent use of spirituous liquors in cases of exposure and fatigue, and to suit the clothing to the climate and season. The virtue of spirits is very much heightened by infusing garlick in them, and this is perhaps the best known preservative for seamen against the cold and damps of northerly climates.

There is another circumstance highly deserving attention, though not referable to any of the articles we have mentioned. It is the state of the ship's coppers, which not being tinned are extremely apt to contract verdigrise, one of the most deadly poisons known, and frequently the unsuspected cause of disorders.

REMARKS

REMARKS on the WEST-INDIA Station.

The following remarks upon this subject are important, as they particularly respect the West-India station.

1. The abuse of spirituous liquors is extremely pernicious every where, but a number of circumstances concur to make it particularly so here. Rum is not only cheap and easily procured, but that which is sold to sailors is generally of an extremely bad and unwholesome quality. Add to this that this species of debauchery is more hurtful in a hot than in a cold or temperate climate. No pains should therefore be spared to keep such rum from them, and care should be taken that they be supplied with what is old and sound. A water or two more should be added to the grog in this climate, or wine should be served in place of it.

2. Seamen should be allowed to go on shore as little as possible, especially at night, for they are here exposed not only to the land air from marshes that are generally near the shore, and thereby catch intermittent fevers, but they find the means and opportunity of getting drunk. The sure and natural remedy of these evils is to prevent them as much as possible from going ashore, and on no account to permit them to stay all night. Many valuable lives would be saved by each ship hiring a boat's crew of negroes or others seasoned to the climate for the purpose of wooding and watering. It most commonly happens that part of the ship's company are under the necessity of performing these duties, and in this case they will be preserved from harm by each man taking half a wine glass or less of the tincture of Peruvian bark before going ashore.† If this is

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† This may be thought too troublesome to be practised in the hurry of service, and I have in general purposely avoided mentioning any thing but what is easily practicable and highly important to the body of seamen at large, but such a precaution as is mentioned above may, at least, be serviceable to officers, or to a ship's company where service is easy and on a small scale.

It was found the means of preventing sickness on the coast of Guinea, by Mr. Robertson, surgeon of the Rainbow, in the late peace, and by the same means Count Bonneval and his suite

entirely

too expensive, or cannot be supplied in sufficient quantity, any bitter tincture, or even a dram of plain spirits, will in some measure answer the same purpose.

3. The cold bath, especially in the morning, before the heat is intense and the perspiration profuse, has been found of the utmost benefit in preserving health in hot climates. Those who have had the perseverance to make their men practice it, have been amply rewarded for their trouble by their ship's company remaining healthy. I could name instances of this fact both in the East and West-Indies.

4. Care should be taken not to harass men too much with labour or other hardships upon first coming to this climate, for these are favourable to the attack of the fevers and fluxes with which almost all ships are more or less seasoned upon their first arrival.

5. As men are more subject to sickness in port than at sea, this might be remedied by making the ship ride with a spring upon the cable, and by making her lie as much out of the lee of the land as is safe and convenient, especially where the adjacent shore is muddy or swampy. This last circumstance is in some situations of the utmost consequence, and a hundred fathoms in a road has been known to make a most essential difference in the health of a ship's company.

OF WATER.

As water is one of the articles most essential to the health of a ship's company, it deserves particular attention. Spring water is to be preferred to running water, as the latter, especially in a hot climate which teems with life, is apt to be impregnated with decayed vegetable and animal substances, such as leaves, grass, wood and insects. This is the most prejudicial

entirely escaped sickness in the camps in Hungary while half the army was cut off by fevers. In consequence of Mr. Robertson's and Capt. Collingwood's representation of the effects of the bark, both in preventing and curing fevers, the ships fitted for the coast of Guinea have been supplied gratuitously with it, and Government would find its account in extending this to all the Tropical Stations.

judicial kind of impurity, for the mineral impregnations common in springs are seldom at all unwholesome, and do not tend like the other to make the water corrupt. It is of consequence that the casks be well seasoned by age and use, and a fumigation with sulphur before they are filled has the best effect in preventing them from contaminating the water. It has also been found that butts by being filled for some time with sea water, are thereby prevented from communicating any bad quality to fresh water. If running water only can be had, the best means of rendering it pure and sweet is to put a pint of quick-lime into each butt when it is filled. I have mentioned that this has been thought to have some effect in preventing the flux. There are several other substances that have been found useful in correcting bad water, such as alum, cream of tartar, burnt biscuit, vinegar and acid fruits, such as tamarinds.* If water is grossly impure, filtering is one of the best means of purifying it. As a dripping-stone will not produce enough for a ship's company, the following expeditious method may be practised. Let a quantity of sand be put at the bottom of a barrel placed on one end, without the head, and let another barrel of a much smaller size, with both ends knocked out, or an open cylinder of any kind, be placed erect in it, and almost filled with sand; if impure water be poured into the small barrel or cylinder, it will rise up through the sand of both barrels, and appear pure above the sand of the large one in the interval between it and the small one. But if water should be offensive by being long kept, the most effectual and expeditious method of sweetening it is by exposing it to the air in as divided a state as possible; and this is best done by Mr. Osbridge's machine, which no ship should be without. If it is wanting, the place of it may in some measure be supplied by blowing air through the water with a long-nozzled bellows, or the following contrivance will be found to afford a sufficient supply of sweet water to particular messes, and will answer the purpose of a dripping-stone. Let the narrow mouth of a large funnel be filled with a bit of sponge, over which let there be a layer of sand and gravel.

* Sir Charles Saunders found that the water of the river St. Lawrence brought on fluxes, and that four pounds of burnt biscuit put into each butt removed the noxious quality.

gravel covered with a piece of flannel, and over the whole another layer of sand. Care must be taken to change the sand, sponge, &c. whenever they become loaded with the impurities of the water.

There should be in every ship an apparatus for distilling water in case of distress. This consists merely of a head and worm adapted to the common boiler, and the distillation may go on while the victuals are boiling.* More than eight gallons of excellent fresh water may be drawn off in an hour, from the copper of the smallest ship of war.

III. Of

* The place of it may be supplied by a tea kettle with the handle taken off and inverted upon the boiler with a gun barrel adapted to the spout passing through a barrel of water, or kept constantly wet with a mop. I cannot help here mentioning also, that in case of great extremity, it has been found that the blood may be diluted, and thirst removed by wetting the surface of the body even with sea water, the vapour of which is always fresh, and is inhaled by vessels on the skin, whose natural function it is to imbibe the moisture that floats in the atmosphere.

It may be added, that in case of necessity, every contrivance should be fallen upon to save rain water, which is always wholesome and pure.

III. OF SCURVY.

THIS is the disease most fatal to seamen next to fevers. It was formerly perhaps as fatal, but some modern improvements in the mode of life have rendered it less frequent and violent. Under it I comprehend not only the actual disease called Scurvy, but that habit of constitution which though compatible with all the duties and functions of a seaman, yet upon the least scratch being received, particularly on the lower extremities, in this climate, a large and incurable ulcer ensues, which loses many good and able men to the service. It is chiefly owing to the quality of the diet at sea, but this is assisted by a variety of other circumstances that render its progress more rapid, and cause the disease to appear when diet alone would not have the effect. The greatest part of the food of a ship's company is necessarily salt provisions. Biscuit and pease, though of a vegetable nature, are hard of digestion, and though they no doubt qualify the animal food, they do not answer the purpose of fresh vegetables. There are several other circumstances besides diet which contribute to render a sailor's life unnatural and full of hardship, and concur with it in producing scurvy. These are chiefly a scarcity or bad quality of water, a cold moist and foul air, either from climate or from the manner in which a ship is kept, bad clothing, damp and dirty bedding or apartments, and too much crowding. It is also remark'd that the lazy and indolent are always most liable to it.

With regard to provisions, besides its being recommended to carry to sea as large a supply of live stock and small beer, or other fermented liquors as the nature of those articles will allow, the world has lately been made acquainted with articles of a more durable and portable nature, which so qualify the salt provision and crude biscuit that they can be used without inducing disease.† These are chiefly Malt and Sourkrout, with

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† *As bread is a principal article of diet, the utmost care should be taken in preserving it, and great advantage would arise from keeping it in casks that are water tight instead of keeping it in bags or laying it loose in a bread-room. Capt. Cooke by this method, and by giving it a cast of*
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with which may be enumerated portable soup, vinegar, the juice of lemons and oranges, the essence of spruce, and in general all vegetable substances preserved either by salt,* sugar. or vinegar. Sago, salop, currants, and eggs preserved by greasing and putting them in salt, may also be mentioned, if not as common store, at least as necessaries for the sick and recovering. It must likewise be observed that such is the excellence of those articles of food and medicine, particularly the malt, lemons, oranges, and sourkrout, that they are efficacious in curing as well as preventing the Scurvy †

It is to be observed, with regard to the West-Indies, that when a ship is in port encouragement should be given to the sale of roots, greens, fruits, sugar and molasses. These may be procured by exchanging for them as much of the ordinary allowance of bread, beef and pork, as can be spared. || Butter being an unwholesome article of diet in this climate, and

the oven in the course of the voyage, preserved his biscuit sound in every respect for more than three years. The same may be said of malt, which being well rammed in casks of this kind will keep for nearly the same length of time. It is also to be remarked that flour by being extremely well pressed will keep any length of time, and it would perhaps, in many cases, answer better to send it to foreign stations in this form rather than that of biscuit. There would be a considerable saving in the expences of freight, and the biscuit would be sounder, by being baked on the spot.

** Green vegetables of all kinds may be preserved by salt for more than a twelvemonth, with their original flavour and freshness when washed from the brine.*

† Capt. Cooke found the malt most beneficial, and that a pint of wort given twice a day never failed to remove the first appearances of the complaint. Dr. Lind, whose observations have been more accurate and extensive than those of any other Physician, is of opinion that the juice of oranges, lemons, and limes, is the most powerful anti scorbutic. The Roman armies are supposed to have been preserved from disease by the use of vinegar.

|| This is commonly left to the management of the sailors themselves who generally make a very bad bargain, but it is worth making a public concern of it. It might be managed by instituting short allowance in the following manner. Let only so much bread, flour, or salt provisions, particularly the latter, be issued as are absolutely necessary, and let the balance for the ship's company be thrown into one estimate; Let the agent victualler pay into the Purser's hands, the value of these provisions in money at the contract price, with such a discount as will allow for the use of the money. Let the Purser, in return, give him a receipt as for so much provision as have been checked. This money being distributed in the name of short allowance, will enable the people to buy vegetables, and the King's provisions will be saved for a time of want, or for a cruise. More money will be raised in this manner than by the common method of compensating for the short allowance, by making it payable at home, and the small additional expence is no consideration in comparison to the health of the men. It has been found by experience, that men have preserved their health and strength in long southern voyages with the allowance of salt provision for one day in the week only.

and also very corruptible, should be no part of the victuals sent to this station. Its place may very properly be supplied by sugar or molasses, the natural produce of the country. These are extremely wholesome, nourishing, and anti-scorbutic, and those who have tried to substitute them for butter have found the change to be popular among the seamen.* When captures are made, in which there are molasses, sugar, rice or cocoa, part should be appropriated to the use of the ship's company and deducted from their fourth part.

Besides diet, there are other articles of the naval œconomy almost as essential to the prevention of this disease. As indolence is both a cause and a symptom of it, idleness and *skulking* should be rigidly discouraged, unless the disease is so far advanced as to render it cruel and even impossible to force men to take exercise. The same tone of mind that inclines a man to laziness disposes his temper also to low spirits, which tend to foment every disease, but particularly the scurvy, and encouragement should be given to whatever produces jollity, contentment and good humour. It is uniformly observed that seamen are less subject to scurvy than marines and landsmen, which is probably owing to the greater activity of their life and alacrity of their minds. The other circumstances of most importance are, dryness, airiness, roominess, every article of cleanliness, and warm clothing where the climate and season require it. The directions given in these points for the prevention of fevers will also serve on this head, and it may be remarked farther in favour of cleanliness that it is not only directly conducive to health, but to good order, sobriety

* Molasses and rice were found so effectual in preventing and curing the scurvy in North-America that Lord Howe issued a general injunction for the use of them, and the success was answerable to his expectation. The use of salt provisions should at the same time be strongly prohibited. Oatmeal is in a great measure an unnecessary article of expence to Government in victualling for this country, both because the articles we have mentioned are fully more cheap and wholesome, and the seamen like it so little that they will hardly touch it. A small quantity, however, would be extremely useful if employed to make what is called Flummery or Sagoine, which is a food extremely light, cooling, and easily prepared, and was found to cure scurvy effectually on board the *Essex* in the late war. Capt. Cooke found wheat to answer in place of oatmeal, and this or barley would be a good substitute, for part of it at least, in victualling the navy. A great part of the oatmeal that is served is thrown overboard, and without determining which grain is most wholesome, any change that can induce men to eat a great quantity of either with their salt provisions must have a good effect.

sobriety and other virtues.* It is also worth observing, with regard to general health, that there are few things more deserving of attention than the guarding against excessive fatigue. It would be well if it could be rendered convenient at all times, except in cases of danger or emergency, to put the men at three watches instead of watch and watch. This would have the most happy effect upon their health, by allowing them to have compleat rest, and to get thoroughly dry. Fatigue is a very frequent means of bringing on disease and breaking the constitution, and it is a circumstance in which young officers are apt to forget themselves. They should therefore take care how they *call all hands* wantonly, and oblige men to exertions beyond their strength, especially as this will be submitted to more readily by sailors than any other set of men, from the generous alacrity of their nature. One of the happy effects resulting from the good treatment of seamen is the encouragement it gives men to enter into the service, and to do their duty with cheerfulness and resolution. There is something more daunting to the mind of man to see his fellow creatures languishing in disease, or perishing miserably from sores or sickness, than in the terrors of fire and sword.

The whole of these observations are meant to have respect to the prevention of disease, and the means of it fall within the province of those who are entrusted with the direction of the navy, either in a civil or military capacity. But with regard to cure and recovery a great deal is also in their power by providing and recommending proper diet and cordials.† A liberal use of good wine would save many lives, both by its virtue in curing low and malignant fevers, and as a restorative to convalescents, numbers

* The importance of this will further appear when we consider the effect of filth upon the general health of mankind, for it is the origin of a very large tribe of acute diseases (by which are meant fevers and feverish complaints.) This is one of the curses entailed on us by clothing, which, more than any of the deviations from nature peculiar to our species, renders man subject to disemper above the rest of the animal creation.

† Though there is still room for improvement, the Navy, I am told, is now on a better footing with regard to the health and comfort of seamen than in former times. The victuals are in general sounder and better; the civil department has shewn in many instances a readiness to adopt the means and to furnish the articles that have been recommended for the health of the men; and such commanders as I have the honour to know are humane, attentive and intelligent.

numbers of whom are lost by relapses, or pine away in dropfies and other chronic complaints, for want of suitable diet in the article of drink as well as food. The necessaries of a surgeon are by no means adequate to this, and care should be taken to lay in portable soup, rice, sago, salop and currants, and to procure fresh meat wherever it can be had for the convalescent and scorbutic patients. It is needless to say that this would not only be an object of humanity, but a great pecuniary saving, considering how expensive it is to support invalids, and to replace men; not to mention that it is upon the health and lives of men that all public exertions essentially depend.*

Since we are upon this subject, it may be observed that there are several particulars in which officers may be subsidiary to the surgeons. For example, it is of the greatest consequence that men should complain early, as very little medical attention will prevent a fever or flux if taken in time, particularly in this climate. As seamen are averse to complain, and may escape the attention of the surgeon till their distemper has gained ground, officers, by noting in a book made on purpose for the daily inspection of the surgeon, those who are missed from duty upon calling the watch, and even those who are remarked to droop and look ill, may get men put upon the sick list, and proper means used for their recovery in the beginning of their complaints.

Upon the whole, there is no situation of life in which there is room for more virtues, more conduct and address, than that of a sea officer. Men are thrown upon his humanity and attention in more views than one: They are subject to a more arbitrary exertion of power than the constitution authorizes in other departments of the State: it is their character

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* It would be endless to enumerate the accounts furnished by history of the losses and disappointments to public service from the prevalence of disease in fleets. Without mentioning the disasters occasioned by it to Sir Richard Hawkins, who says that in twenty years he had known of ten thousand men who had perished at sea by the scurvy, nor to Commodore Anson, who in the course of his voyage lost more than four fifths of his ship's company. I shall recount a few instances that have occurred to me in history of expeditions that have been frustrated in their object from the force of disease alone: That under Count Mansfeldt in 1624: that under the Duke of Buckingham the year after: that under Sir Francis Wheeler in 1693: that to Carthagena in 1742: that of the French under D'Anville in 1746; and that of the same nation to Louisbourg in 1757.

to be thoughtless and neglectful of their own interest and welfare, requiring to be tended like children, and from their utility, bravery and other respectable qualities, they are surely entitled to a degree of parental tenderness and attention, both from the State they protect and the officers they obey.

T H E E N D.